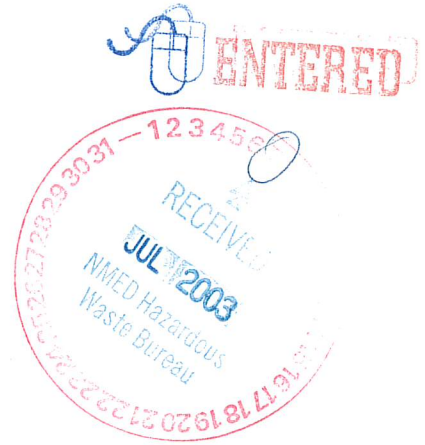


Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
July 3, 2003



Mr. Steve Zappe, WIPP Project Leader
Hazardous Waste Permits Program
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2905 E. Rodeo Park Drive, Bldg. 1
Santa Fe, NM 87505

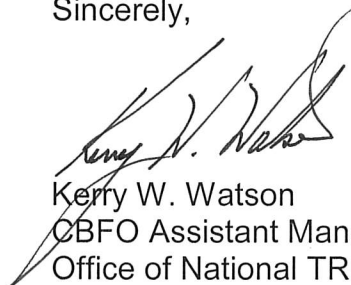
Subject: Transmittal of Approved Waste Stream Profile Form NTS54MIX1R0 by the
Central Characterization Project at Nevada Test Site

Dear Mr. Zappe:

The Department of Energy, Carlsbad Field Office (CBFO) has approved the Waste Stream Profile Form NTS54MIX1R0 by the Central Characterization Project at Nevada Test Site. Enclosed is a copy of the approved form as required by Section B-4(b)(1) of the WIPP Hazardous Waste Facility Permit No. NM4890139088-TSDF.

If you have any questions on this matter, please contact me at (505) 234-7357 or (505) 706-0066.

Sincerely,



Kerry W. Watson
CBFO Assistant Manager
Office of National TRU Program

Enclosure

cc: w/o enclosure
J. Kieling, NMED
C. Walker, TechLaw
J. Bennett, WTS
P. Roush, WTS
L. Greene, WRES
S. Calvert, CTAC
CBFO M&RC

CCP-TP-002, Rev. 12
CCP Reconciliation of DQOs and
Reporting Characterization Data

Effective Date: 04/30/2003

Page 29 of 40


Attachment 2B - Waste Stream Profile Form

(1) Waste Stream Profile Number: NTS54MIX1R0		
(2) Generator site name: Nevada Test Site	(3) Technical contact: Courtland Fesmire	
(3) Generator site EPA ID: NV380090001	(3) Technical contact phone number: 505-234-7548	
(4) Date of audit report approval by NMED: February 17, 2003		
(4) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, Rev 6, CCP Transuranic Waste Characterization Quality Assurance Project Plan, June 11, 2003 CCP-PO-002, Rev 6, CCP Transuranic Waste Certification Plan, June 11, 2003 CCP-PO-009, Rev 6, CCP NTS Interface Document, June 28, 2003 CCP-AK-NTS-001, Central Characterization Project Acceptable Knowledge Summary Report For NEVADA TEST SITE LAWRENCE LIVERMORE LABORATORY WASTE, January 6, 2003		
Did your facility generate this waste? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(5) If no, provide the name and EPA ID of the original generator: Lawrence Livermore National Laboratory CA2890012584	
Waste Stream Information¹		
(6) WIPP ID: NTLLNL-S5400-MIX-1	(7) Summary Category Group: S5000	
(8) Waste Matrix Code Group: S5400 Heterogeneous Debris	(9) Waste Stream Name: Heterogeneous Debris from Buildings 251 and 332	
(10) Description from the TWBIR: NT-W001: Waste stream consists of glovebox parts, laboratory trash, contaminated equipment and solidified sludge. The waste stream was generated at LLNL and shipped to NTS from 1974 to 1990.		
(11) Defense TRU Waste: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(11) Check One: <input checked="" type="checkbox"/> CH <input type="checkbox"/> RH	
(11) Number of SWBs 0	(11) Number of Drums 2 (55 gallon)	(11) Number of Canisters 0
(12) Batch Data report numbers supporting this waste stream characterization: See Attachment 3 Table 1 of the Characterization Information Summary (CIS)		
(13) List applicable EPA Hazardous Waste Codes: ² D004, D005, D006, D007, D008, D009, D010, D011, D019, D022, D027, D028, D029, D040, F001, F002, F003, F004 and F005		
(14) Applicable TRUCON Content Codes: NT225B, NT125A, NT125B, NT225A,		
Acceptable Knowledge Information¹		
[For the following, enter supporting the documentation used (i.e., references and dates)]		
Required Program Information		
(15) Map of site: CCP-AK-NTS-001, January 6, 2003, Figures 4-1, 4-2, 4-4 and 4-5		
(15) Facility mission description: CCP-AK-NTS-001, January 6, 2003, Section 4.1.4		
(15) Description of operations that generate waste: CCP-AK-NTS-001, January 6, 2003, Section 4.3 and Table 4-1		
(15) Waste identification/categorization schemes: CCP-AK-NTS-001, January 6, 2003, Section 4.4		
(15) Types and quantities of waste generated: CCP-AK-NTS-001, January 6, 2003, Section 5.0, 5.2, 5.4, 6.0, 6.2, 6.4, 10.0, 10.2, and 10.4		
(15) Correlation of waste streams generated from the same building and process, as appropriate: CCP-AK-NTS-001, January 6, 2003, Section 4.2.2 and Table 4-1		

Attachment 2B – Waste Stream Profile Form (continued)

(15) Waste certification procedures: CCP-PO-001, Rev 6, CCP Transuranic Waste Characterization Quality Assurance Project Plan, June 11, 2003 CCP-PO-002, Rev 6, CCP Transuranic Waste Certification Plan, June 11, 2003 CCP-TP-002, Rev 13, CCP Reconciliation of DQOs and Reporting Characterization Data, June 27, 2003 CCP-TP-003, Rev 13, CCP Sampling Design and Data Analysis for RCRA Characterization, June 28, 2003 CCP-TP-005, Rev 12, CCP Acceptable Knowledge Documentation, March 26, 2003 CCP-TP-030, Rev 8, CCP WWIS Data Entry and TRU Waste Certification, March 26, 2003	
Required Waste Stream Information	
(16) Area(s) and building(s) from which the waste stream was generated: CCP-AK-NTS-001, January 6, 2003, Section 5.1, Figure 5-1, 6.1, Figure 6-1, and 10.1	
(16) Waste stream volume and time period of generation: CCP-AK-NTS-001, January 6, 2003, Section 5.2, 6.2, and 10.2	
(16) Waste generating process description for each building: CCP-AK-NTS-001, January 6, 2003, Section 5.3, 6.3, and 10.3	
(16) Process flow diagrams: CCP-AK-NTS-001, January 6, 2003, Figure 4-3	
(16) Material inputs or other information identifying chemical/radionuclide content and physical waste form: Process flow diagrams are not available for the R and D activities at LLNL. However, a material flow diagram is presented in CCP-AK-NTS-001, Figures 5-2 and 6-2. In addition tables of waste material sources and definitions are provided in CCP-AK-NTS-001, Tables 5-1 and 6-1 (waste items), Tables 5-3 and 6-3 (F-listed compounds) and Tables 5-4 and 6-4 (metals).	
Which Defense Activity generated the waste: (check one)	
<input type="checkbox"/> Weapons activities including defense inertial confinement fusion	<input type="checkbox"/> Naval Reactors development
<input type="checkbox"/> Verification and control technology	<input checked="" type="checkbox"/> Defense research and development
<input type="checkbox"/> Defense nuclear waste and material by products management	<input type="checkbox"/> Defense nuclear material production
<input type="checkbox"/> Defense nuclear waste and materials security and safeguards and security investigations	
Supplemental Documentation	
(17) Process design documents: none compiled (LIST OF SOURCE DOCUMENTS ATTACHED)	
(17) Standard operating procedures: P007L, P008L, P009L, P010L, P011L, P012L, P018L, P019L, P020L, P021L, P022L, P029L, P038L, P039L, P041L, P043L, P044L, P045L, P046L, P048L, P050L, P051L, P063L, P064L, P065L, P066L, P068L, P069L, P070L, P076L, P077L, P079L, P080L, P081L, P082L, P083L, P084L, P085L, P086L, P087L, P089L, P090L, P095L, P096L, P097L, U007L, U008L, U012L, U025L, U034L, U035L, U036L, U037L, U038L, U046L, C116L,	
(17) Safety Analysis Reports: P027L, P040L, P045L, P046L, P088L, U013L	
(17) Waste packaging logs: P055L, U029L, U051L	
(17) Test plans/research project reports: P052L, P053L, P054L, P056L, P057L, P058L	
(17) Site databases: P024L, P025L, U003L, U016L, U019L, U024L, U051L, U052L	
(17) Information from site personnel: C043L, C046L, C054L, C055L, C057L, C059L, C061L, C064L, C067L, C069L, C070L, C073L, C075L, C076L, C077L, C078L, C086L, C089L, C090L, C091L, C092L, C093L, C094L, C095L, C096L, C097L, C098L, C099L, C100L, C102L, C103L, C105L, C107L, C108L, C109L, C110L, C112L, C114L, C128L	
(17) Standard industry documents: P030L, P031L, P033L, P034L, P035L, P049L, P061L, C113L	
(17) Previous analytical data: P024L, P049L, U052L, U053L, U056L	
(17) Standard industry documents: P030L, P031L, P033L, P034L, P035L, P049L, P061L, C113L	
(17) Material safety data sheets: P062L	
(17) Sampling and analysis data from comparable/surrogate Waste: none compiled	
(17) Laboratory notebooks: U017L	
(17) Sampling and Analysis Information²	
For the following, when applicable, enter procedure title(s), number(s) and date(s)	
	(18) Radiography: CCP-TP045, Rev 6, CCP RTR #5 Radiography Inspection Operating Procedures, January 31, 2003
	(18) Visual Examination: CCP-TP-061, Rev 4, CCP TRU Waste Visual Examination, Segregation and Repacking, May 21, 2002

Attachment 2B – Waste Stream Profile Form (continued)

Headspace Gas Analysis			
(19) VOCs: CCP-TP-007, Rev 16, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, February 3, 2003 CCP-TP-009, Rev 11, CCP Single Sample Manifold Data Handling Procedure, February 5, 2003 CCP-TP-029, Rev 11, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, February 12, 2003 CCP-TP-032, Rev 10, CCP Single Sample Manifold Data Validation Procedure, February 3, 2003			
(19) Flammable: CCP-TP-007, Rev 16, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, February 3, 2003 CCP-TP-009, Rev 11, CCP Single Sample Manifold Data Handling Procedure, February 5, 2003 CCP-TP-029, Rev 11, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, February 12, 2003 CCP-TP-032, Rev 10, CCP Single Sample Manifold Data Validation Procedure, February 3, 2003			
(19) Other gases (specify): N/A			
Homogeneous Solids/Soils/Gravel Sample Analysis			
(20) Total metals: N/A (not analyzing homogenous solids in this waste stream)			
(20) PCBs: N/A (not analyzing homogenous solids in this waste stream)			
(20) VOCs: N/A (not analyzing homogenous solids in this waste stream)			
(20) Nonhalogenated VOCs: N/A (not analyzing homogenous solids in this waste stream)			
(20) Semi-VOCs: N/A (not analyzing homogenous solids in this waste stream)			
(20) Other (specify): N/A (not analyzing homogenous solids in this waste stream)			
Waste Stream Profile Form Certification:			
I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.			
(21)		Courtland Fesmire, P.E.	1 July 03
Signature of Site Project Manager		Printed Name	Date
NOTE: (1) Use back of sheet or continuation sheets, if required. (2) If radiography, visual examination, headspace gas analysis, and/or homogeneous solids/soils/gravel sample analysis were used to determine EPA Hazardous Waste Codes, attach signed Characterization Information Summary documenting this determination.			

Overview

This summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) Number NTS54MIX1R0 for Heterogeneous Debris Waste relating to the facility's history, configuration, equipment, process operations, and waste management practices. The Waste Stream Number associated with this waste is NTLLNL-S5400-MIX1. Information contained in this summary was obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and interviews with facility personnel, past and present. This summary is derived from "CCP-AK-NTS-001 Central Characterization Project Acceptable Knowledge Summary Report for NEVADA TEST SITE LAWRENCE LIVERMORE LABORATORY WASTE", Revision 5, dated January 6, 2003.

The NTS stores CH-TRU waste that was generated at LLNL. This waste stream contains waste that were generated from Buildings 251 and 332 and later repackaged and combined into drums. The LLNL facility mission was to conduct research on nuclear weapons fabrication and materials research. Building 251 (Heavy Element Facility) was to provide LLNL capability to conduct basic research and development on up to kilocurie quantities of actinides. Operation in Building 251 involved two major categories: diagnostic activities associated with the underground testing of nuclear devices and basic research on the behavior of heavy elements. Building 332 (the Plutonium Facility) provided a local capability for the safe handling and storage of plutonium in the quantities required for nuclear weapons Research and Development (R & D), including weapons component subassembly fabrication.

Waste Stream Identification Summary

Site Where TRU Waste Was Generated:	Lawrence Livermore National Laboratory
Site Where TRU Waste Is Currently Stored:	Nevada Test Site, Area 5
Waste Stream Name:	Heterogeneous Debris from Buildings 251 and 332
Waste Stream Numbers:	NTLLNL-S5400-MIX1
Waste Stream Profile Form Number:	NTS54MIX1R0
Dates of Waste Generation:	October 1972 – December 1987
Facility Where TRU Waste Was Generated:	LLNL Buildings 251 and 332
Repackaging Dates:	June 1998 – September 2001

Waste Stream Volume:	0.416 m ³ 2 55-gallon drums
Summary Category Group:	S5000
Waste Stream TWBIR Identification:	NT-W001
Waste Matrix Code Group:	Heterogeneous Debris
RCRA Hazardous Waste Codes:	D004, D005, D006, D007, D008, D009, D010, D011, D019, D022, D027, D028, D029, D040, F001, F002, F003, F004, F005
Waste Matrix Code:	S5400 – Heterogeneous Debris
TRUPACT-II Content Code (TRUCON):	NT125A, NT125B, NT225A, NT225B

Waste Stream Description

The waste consists of mixed glovebox bagout waste, nonline-generated laboratory trash, contaminated small equipment, and small quantities of solidified liquids and sludges, and solid combustible and noncombustible mixed glovebox bagout waste, derived from research activities performed in a laboratory environment. The waste includes soft plastics, rubber, cardboard, rags, paper, cloth, glass, and some contaminated small equipment. The waste stream consists of heterogeneous debris generated in Buildings 251 and 332.

This waste stream is assigned the waste matrix code S5400 "Heterogeneous Debris" because the waste is not dominantly organic or inorganic as defined by the DOE Waste Treatability Group Guidance document. It has not been quantified that the waste stream is >80% inorganic (S5100) or organic (S5300) by volume.

Point of Generation

Building 251 was operated by the Nuclear Chemistry Division for the Defense Systems Program/Defense Sciences Department under the Deputy AD for Nuclear Test. Well over 90 percent of the radioactive waste generated in Building 251 was from diagnostic activities associated with the underground testing of nuclear devices. Building 332 Plutonium Facility was constructed to support nuclear weapons Research and Development. Operations included testing of engineering assemblies containing plutonium and other fissile materials; development of advanced metallurgy, chemistry,

and engineering techniques; and fundamental and applied plutonium research (CCP-AK-NTS-001). Within the building was a laboratory used for metallurgy, chemistry, and characterization of plutonium based metals.

Generating Processes

Description of Waste Generating Processes

The processes by which the waste stream was generated are described in detail in CCP-AK-NTS-001, Section 4.3

Building 251

Diagnostic Tracers

Tracers for identifying the performance of a nuclear explosive device were prepared in Rooms 1035, 1047, and 1053. The diagnostic tracers or "slugs" typically were a mixture of alumina metal and an actinide oxide pressed into pellets or wafers encased in alumina metal jackets. The capsules were coated with a mold release and cleaned with sodium hydroxide, nitric acid, and water. After cleaning, the lids were sealed. To avoid cross contamination, separate enclosures and equipment were required for each isotope. Several actinide oxides were used as tracer materials including americium-241, curium-244, neptunium-237, plutonium-242, uranium-233, and uranium-235/236.

Post-shot diagnostic work was performed in Room 1003. After an underground detonation, rock was reclaimed from the area of the explosion. Rock samples highly contaminated with an alpha-active radioisotope were placed in a lead-shielded glove box and dissolved to separate and identify the device fraction with its tracers. Hydrofluoric, hydrochloric (typically 4 molar), and perchloric acids were used to prepare the contaminated rock for analysis.

Dilute hydrochloric or nitric acids usually were used for cleaning within the glove boxes. At one time, acetone was also used for cleaning. These chemicals were identified in the Building 251 chemical inventory in the rooms in which tracer work was performed. Organic solvents were not used in the fabrication of tracers.

Other Research

The laboratory in Room 1212 housed a large isotope separator. Up to milligram quantities of ionized high-purity actinides were accelerated using an electromagnetic mass spectrometer that deflected the particles in relation to their mass. Various mass components were collected on different areas of the target, resulting in ultra-high isotopic purity materials which were used as accelerator targets or isotopic standards. The target substrate was typically beryllium metal. The targets were to be used in the accelerator at Lawrence Berkeley Laboratory.

Several actinides were used in target preparation including some exotic isotopes such as berkelium and einsteinium. Selenium metal was identified in the Building 251 chemical inventory, and may have been used as a target substrate or in electron beam sputtering to over plate the targets before shipment.

Rooms 1165 and 1320 contained storage pits designed for providing shielded, water-tight storage for radioactive materials. Rooms 1302, 1320, and 1365 housed four neutron shielded cells and Room 1150 had two cave units that provided a wet chemistry work place for smaller amounts of neutron/gamma materials. Enclosure equipment included: the metal glove box containing HEPA filters which measured and discharged flow; the second type of enclosure was the same as the metal glove box but had additional lead shielding (lead glass window and manipulators were also provided); the third type was neutron-shielded chemistry cells which had walls constructed of steel tanks filled with borated water and occasionally, magnetite ore (manipulators were used to perform operations in these cells). The northwest section of the building was upgraded to provide higher levels of protection against earthquake, wind, and fire damage. This section of the facility was referred to as the "hardened" area and was approved for working with up to 50 Ci materials. Rooms outside of the hardened area were permitted to have up to 5 Ci that were not in hardened containers, but kilocurie amounts of material was stored in hardened containers. About half of the hardened area was devoted to the fabrication of capsules containing aluminum metal powder and actinide oxide mixtures (used as tracers for identifying the performance of a nuclear explosive). Also associated with the postshot evaluation was the capability for dissolving recovered rock to separate and identify the device fraction and its detectors and tracers.

Rooms 1302, 1320, and 1365 were combined into one large room that housed neutron-shielded research cells. In room 1364, fundamental research was performed by reacting various actinides (primarily transcurium actinides) with halogens and their physical properties were studied. Once reacted, the radionuclides were put into capillary tubes, x-rayed, and the patterns from the x-ray were studied to determine the resulting compound's structure. Room 1117 was known as the "box room" since it contained 17 glove boxes which were used by individuals who worked in other buildings. Rooms 1211, 1363, and 1142 had chemistry hoods and equipment (hoods were not supplied with HEPA filters so work was limited). Wet chemistry separations were conducted in these hoods.

Rooms 1225, 1301A, 1234, 1301, 1321, and 1330 were shops used for repairing, manufacturing, or assembling the various mechanical or electrical equipment used in the building. Room 1234 had close capture capabilities for performing machine shop operations on actinide contaminated equipment. Rooms 1359 and 1116 were counting laboratories. Room 1359 measured the radioactive content of materials with low levels of activity. Room 1116 measured sources with higher

levels of radioactivity. Room 1362 and 1027 measured the amount of heat produced by the decay of radioactive nuclides, another means of determining radioactive content.

Rooms 1225, 1130, 1165, 1301B, 1312, 1354, and 1320 were used primarily for storage. Room 1165 stored high-level, non-fissile radionuclides. Fissile material was stored in Room 1320 in pits.

Rooms 1053 and 1048 were labs that shared space in the hardened area and could accommodate >5 Ci of radioactive material. Room 1053 used glove boxes while 1048 used water shielded caves.

Numerous other rooms were used for research activities. Examples of other research activities included studying the initial steps leading to fission of nuclei, identification of new elements, and other actinide behavioral studies.

Chemical Separation

Chemical separation processes were required to prepare actinides for use in tracer preparation as well as other activities related to understanding heavy element nuclear behavior. Processes included ion exchange, precipitation, centrifugation, liquid transfer, solution evaporation, liquid-liquid extraction, and electrodeposition.

A solution of an alcohol and acid was used to dissolve samples for electroplating. Cyanide compounds were not used in electroplating. Benzene, toluene, and xylene were used in liquid-liquid extraction. Chloroform, carbon tetrachloride, carbon disulfide, and methyl isobutyl ketone were identified in the Building 251 chemical inventory in Rooms 1142 and 1211. These compounds also may have been used in liquid-liquid extraction. Barium nitrate, chromium chloride, silver oxide, iron, and zinc were in the chemical inventory and may have been used as carriers in the precipitation process. Other chemicals identified in Rooms 1142 and 1211 include acetone, ethyl acetate, chromium metal, chromium trioxide, sodium dichromate, lead, lead oxide, mercury, mercuric nitrate, mercurous nitrate, and selenium metal.

Liquid Waste Solidification

Prior to 1987, small amounts of radioactively contaminated liquids originating in Building 251 that exceeded the 150 mg/L Pu limit were solidified in Room 1314. This small amount of solidified waste was added to S5400 waste containers with other S5400 waste parcels, also generated in Building 251. If the radioactively contaminated liquid was below the 150 mg Pu/L limit, it was sent to Hazardous Waste Management Operations (HWMO), Building 419, for solidification. The waste from Building 419 is a separate waste stream which is addressed in a

separate waste stream profile form. Beginning in 1987, only liquids with less than 2 mg Pu/L of waste concentration were solidified by HWMO. If the limit was exceeded, the liquid was solidified within Room 1314.

Liquids solidified in Room 1314 were neutralized to a pH level of 4 to 12 and solidified in ice-cream cartons with a mixture of Portland or gypsum (Envirostone) cement, depending on if they were aqueous or organic-based. The solidified liquid waste was placed in drums with other wastes and treated as TRU.

Operations Support

Several rooms had shops to repair, manufacture, or assemble the various mechanical or electrical equipment used in the building. Although most of these operations were not in radiological areas, machining of actinide-contaminated equipment was conducted in Room 1234. During machining activities, degreasing solvents such as trichloroethylene and methyl ethyl ketone may have been used. These chemicals were identified in the Building 251 chemical inventory.

Samples prepared in other laboratories were evaluated for their radioactive content in the counting laboratories in Rooms 1116 and 1359. In Rooms 1027 and 1364, radioactive content was determined by measuring the amount of heat produced by the decay of radioactive nuclides.

Building 332

The LLNL Building 332 Plutonium Facility was constructed to support nuclear weapons R and D. Operations included testing of engineering assemblies containing plutonium and other fissile materials; development of advanced metallurgy, chemistry, and engineering techniques; and fundamental and applied plutonium research (CCP-AK-NTS-001). Within the building was a laboratory used for metallurgy, chemistry, and characterization of plutonium based metals. A foundry, machine shop, and assembly facilities were also located in the Radioactive Materials Area (RMA) of the building. In addition facilities to support laser isotope separation and chemical processing of plutonium were located in the building. Waste Items and Materials are tabulated in Table 6-1 of CCP-AK-NTS-001. Table 6-1 contains several items that are prohibited from certification and disposal at the WIPP. During the characterization process, the waste containers undergo 100% RTR to ensure that prohibited items are not included in the waste drums as specified in the operating procedures. Many of the processes within the 332 building were classified and therefore classified materials resulting from these processes have been separated from the unclassified waste (CCP-AK-NTS-001, Section 6.3). This waste stream does not include classified materials.

Fabrication

Several rooms in Building 332 fabricated fission-stage subassemblies from piece-part blanks, applied engineering measurement instrumentation and conducted limited nondestructive tests on subassemblies. These areas were also equipped to perform post-test activities.

Room 1345 of Building 332 contained a series of enclosures where subassemblies were fabricated and evaluated. This room contained two gloveboxes for contamination control during assembly and disassembly. Other test instrumentation was also located in this room.

Additional assembly operations were conducted in room 1353, where TCE was used for degreasing. Also in this room was a vapor-plating unit capable of metal deposition, furnace brazing or electron beam welding. Assembly and disassembly of radiation experiments was conducted in rooms 1345 and 1353. These experiments used lithium-6 hydride, lithium-6 deuteride, beryllium and plutonium. Density determinations of plutonium and uranium parts used an immersion technique. Actinide parts and assemblies were immersed in FC-40. Glume glass cleaner (aerosol) was used for cleaning glove box interiors.

Room 1362 was used for machining and parts inspection. Beryllium was also machined in room 1362. TCE was used during machining as a coolant on a mill and a lathe. TCE was used for cleaning equipment. 1,1,1-Trichloroethane was used as a replacement for TCE during the mid 1980's. In room 1362, Isopropyl alcohol and Freon were used for cleaning parts and gauges respectively. Swish (a caustic aerosol cleaner) was used to clean glove box interiors. Isopropyl alcohol was used to clean parts and Freon (aerosol) was used to clean glove box interiors. Several compounds are collectively referred to as "Freon". While Freon is a trademarked name for a series of fluorocarbon products, it is commonly used to refer to a larger group of compounds. Several Freon compounds were used including Freon-113 and Freon-22, however, the literature cited in the AK document most commonly refers simply to Freon without specifying which Freon is being referenced.

In room 1369, actinide parts and assemblies were immersed in FC-40, a Freon compound. Room 1361 was used for welding, brazing, soldering and machining of plutonium. In room 1354, components were welded. Soldering flux, silver solder, acetone, ethanol and methanol isopropyl alcohol were used during welding operations.

A foundry located in room 1370 provided plutonium casting operations. Graphite molds were sprayed with a solution containing yttrium oxide. After the metal was cast, it was loaded into tantalum crucibles with gallium tracer elements including isotopes of Am-241, Cm-244, and Np-237. Swish was used to clean glovebox interiors.

Waste Materials Processing

In Building 332, waste and materials processing included plutonium recovery, waste solidification, pyrochemical processing and atomic vapor laser isotope separation (AVLIS). Various operations generated scrap plutonium that were prepared and shipped to other DOE sites for final plutonium recovery. Uranium-233 and Uranium-235 were also processed in this building. Liquids containing plutonium in concentrations exceeding the discard limits were processed to precipitate plutonium, using sodium hydroxide, which was ultimately ashed with other debris and sent off site. The precipitate was washed with chloroform. Liquids (which could contain oil and TCE) containing less than permissible discard limits of plutonium were solidified using either Envirostone emulsifier and cement or Portland cement.

Plutonium metal and alloy chips were degreased and oxidized in a static inert gas glove box. Pyrochemical processing was also performed by direct oxide reduction, molten salt extraction or hydriding/dehydriding operations. Various solvents including Swish, Freon, and other commercial products were used in these processes. Spent salts and calcium metal were not disposed of with TRU waste.

The AVLIS process used dry lubricant containing molybdenum and graphite. Ethyl, methyl, or isopropyl alcohol, acetone and Swish were used for cleaning the glovebox used for the process.

Laboratories

Several laboratories supported operations in building 332. These laboratories included chemical, x-ray, and metallographic characterization of actinide metals and other radioactive material contaminants. Several methods were used to prepare samples including electropolishing, rough grinding, etching, dissolving, fuming, ion exchange, organic extraction, fusion, and distillation. Many corrosive, flammable and toxic chemicals were used for these methods. These chemicals included most mineral acids, bases and salts. The following chemicals were specifically identified as used in the laboratories in Buildings 251 and 332:

Chemicals Identified in Buildings 251 and 332

Acetone	Benzene	Chloroform
Ethanol	1,1,2-Trichloro- 1,2,2-Trifluoroethane (Freon)	Hydrochloric acid
Hydrofluoric acid	Isopropyl alcohol	Magnesium perchlorate
Methanol	Methyl ethyl ketone	Nitric acid
Carbon disulfide	Ethyl acetate	Ethyl benzene
Potassium carbonate	Potassium hydroxide	Sodium bicarbonate
Sodium hydroxide	Sodium chloride	Sulfuric acid
Toluene	Trichloroethylene	Carbon tetrachloride
Ethyl ether	Methyl alcohol	Methylene chloride
Chromium trioxide	Diamond paste	Ethylene glycol
Kerosene	Lactic acid	Mineral oil
Methyl isobutyl ketone	Tetrachloroethylene	1,1,1-Trichloroethane
Phosphoric acid	Silicone oil	Petroleum ether
Xylene		

Laser dyes were also used for materials characterization that may have used a variety of solvents for dye makeup.

Materials Testing and Development

Numerous techniques were used to determine the physical and mechanical properties of plutonium, plutonium alloys, uranium and other metals when subjected to various conditions. Materials were subjected to tension, torsion, and compression tests at ambient and elevated temperatures. Resistivity and stress tests were conducted on molten and heated metals. Furnaces used for these tests were cleaned with ethanol and tubes were immersed in silicone-based quenching oil. Non-flammable solvent such as Freon were also used to clean equipment used for electron beam evaporation and sputtering. Hydrochloric acid was used to etch parts. Freon and acetone were used to clean parts. Ethanol and Glome, a commercial non-hazardous aerosol cleaner, were used to clean glove boxes.

Location

All waste from this waste stream was generated from Buildings 251 and 332 at LLNL. The waste was repackaged from drums generated in these two buildings. Waste was shipped from Lawrence Livermore to the Nevada Test Site (NTS) from 1974 to 1990. The waste is currently stored at NTS, Waste Management Area 5, building number 5-24, the TRU Pad Cover Building. An ongoing repackaging effort has been underway since 1997. Repackaging takes place in the Visual Examination and Repack Building (VERB). Activities to characterize the waste for shipment to WIPP (non-destructive assay, non-destructive examination, and head space gas sampling) took place in Area 5 near the VERB. Visual Examination took place in the VERB.

RCRA Determinations

The solid debris waste stream NTLLNL-S5400-MIX1 was generated during repackaging of wastes from Buildings 332 and 251 both at Lawrence Livermore and NTS. Therefore, the waste in MIX1 is a combination of the wastes from these two buildings. During the repackaging process, all liquids including any that might be ignitable or corrosive were removed and/or solidified.

Hazardous Waste Determinations

Waste generated in Buildings 251 and 332 does not qualify for any of the exclusions outlined in 40 CFR 260 or 261.

Ignitability

Ignitables are absent from the waste stream generated from Buildings 251 and 332. The waste does not meet the definition of ignitability as defined in 40 CFR 261.21. To further ensure that the waste does not exhibit the characteristic for ignitability, each waste container is processed through RTR and/or VE. Any free liquids (regardless of quantity) any compressed flammable gases are removed as prohibited items. Some chemicals described below to which the F003 hazardous waste code is applied, were used. The F003 code is applied to the waste streams because the solvents were used even though the characteristic is for ignitability. However, as no liquids were allowed in the waste stream, the F-listed chemicals do not exist as liquids and therefore are not ignitable.

Perchloric acid was used in Building 251 in "a couple of drop" quantities for "wet-ashing" and should not be in the waste from this process. It was also used in a non-radiological wet chemistry hood and evaporated to dryness. Also it was reacted with excess hydrofluoric acid in post-shot diagnostic activities. These mineral acids were neutralized and solidified in ice-cream cartons. Liquids were prohibited from waste containers. The ignitability characteristic (D001) does not apply to the waste.

Corrosivity

Acids and bases were used in Buildings 251 and 332. Hydrofluoric Acid was used to dissolve rock in post-shot diagnostics and for stock solution preparation in Building 251. Mineral acids were neutralized and solidified with Portland cement and vermiculite. Due to the neutralization and solidification and the prohibitions on the disposal of liquids since 1986, acid is not expected in the waste stream. AK does identify Hydrofluoric Acid on laboratory chemical inventories from Building 332. However, mineral acids were neutralized and solidified. Based on

this information, Hydrofluoric Acid (U134) is not applied to this waste stream. Free liquids when found by radiography or VE are removed ensuring that corrosive materials are not present in NTS waste shipped to WIPP.

As no liquids are allowed in the waste stream, the corrosivity characteristic (D002) does not apply to the waste.

Reactivity

The following reactive metals were used in Building 332.

Calcium was used in various processes in Building 332, including the direct oxide reduction process. In this process, calcium was oxidized to calcium oxide and chloride salts. These salts may be present in the waste as a result of the direct oxide reduction process. Calcium was also burned before bag out and disposal. Therefore, it is not present in a form that is hazardous or requires treatment. In Building 332 Magnesium was burned or calcined prior to disposal.

Plutonium hydride could be present as a trace contaminant in the TRU waste generated from the glovebox 1023 in Building 332; however, it is not present in sufficient quantities to be reactive.

Lithium-6 hydride and lithium-6 deuteride were used in intrinsic radiation experiments in Building 332. Experimenters described this as a high temperature reaction of either Lithium-6 hydride or lithium-6 deuteride with Plutonium oxide which produced Lithium oxide and Plutonium metal. According to Sax's Dangerous Properties of Industrial Materials, "The nonvolatile hydrides (such as sodium, lithium and calcium) readily liberate hydrogen when heated or on contact with moisture or acids . . . When heated or on contact with moisture or acids, an exothermic reaction evolving hydrogen occurs . . ." In this process, in the presence of PuO_2 , Lithium oxide was produced. According to the experimenters, the lithium oxide was reduced to Lithium metal and then reused, and therefore is not present in the TRU waste.

Hydrogen peroxide was also used but only in 10 to 30 percent solution.

Aluminum powder was used in the fabrication of tracers. Although other aluminum items (such as aluminum foil) are identified in the waste, no containers listing aluminum powder are identified in the AK tracking spreadsheet. The waste materials in this waste stream are stable and will not react violently with water, form potentially explosive mixtures with water or generate toxic gases, vapors or fumes when mixed with water.

The materials found in the waste stream do not contain cyanides or sulfides and are not capable of detonation or explosive reaction. Further, this waste does not present a compatibility hazard due to the chemicals identified with each other or with the packaging of the waste.

To further ensure that the waste does not exhibit the characteristic for reactivity, compressed gases, including non-punctured aerosol cans are managed as prohibited items when identified by radiography and/or VE. The presence of these items causes the drum to be rejected or the items to be removed during the VE process. Therefore, these items are not in the waste. The waste code for reactivity (D003) does not apply to the waste.

Toxicity

The waste in this waste stream meets the definition of toxicity as defined in 40 CFR 261.24.

Arsenic (D004)

Arsenic was listed in one source document as potentially present in LLNL TRU waste. It was also a component of "Arsenazo," a trade-named chemical product listed in a Building 332 chemical tracking database. Based on this information, the D004 hazardous waste number has been assigned to the waste stream.

Barium (D005)

Barium was listed in some source documents that provide general information about potential contaminants at LLNL for Buildings 251 and 332, including its presence in excess of the toxicity characteristic regulatory level in leaded gloves and glovebox windows, which are known to be in TRU waste containers. Barium was also listed in a 1968 Building 332 chemical inventory.

Building 251 TRU waste information described by source documents included barium nitrate as possibly used as a carrier for precipitations. Barium nitrate was listed in a Room 1142 chemical inventory. Barium fluoride, barium sulfate, and barium were listed on Experimental Request Forms. Based on this information, the D005 hazardous waste number has been assigned to the waste stream.

Cadmium (D006)

Cadmium was listed in some source documents that provide general information about potential contaminants at LLNL. D006 was specifically listed as a potential contaminant for Buildings 251 and 332 TRU waste. Cadmium may be present in Building 332 TRU waste based on the following documentation: it was listed as being present in Room 1354 TRU waste; and it was listed in a 1968

building chemical inventory. Cadmium was specifically listed as a potential contaminant for Building 251 TRU waste. Cadmium also appeared on Experimental Request Forms for Building 251 in the 1976-1990 time period.

Based on this information, the D006 hazardous waste number has been assigned to the waste stream.

Chromium (D007)

Chromium was listed in several source documents that provide general information about potential contaminants at LLNL. The D007 hazardous waste number was specifically listed as a potential contaminant for Building 332 TRU waste. The following uses or presence information for chromium in Building 332 TRU waste was described by source documentation: in gloveboxes in water or dilute acid and in chemical standards with concentrations 1-10 parts per million (ppm); in plastic vials in Room 1321; in a 1968 building chemical inventory; used in the Pyrorebox refining process; and listed for Rooms 1322 and 1330A as chromium trioxide in a 1976 inventory.

The following uses or presence information for chromium in Building 251 TRU waste was described by source documentation: chromium metal, sodium dichromate, chromium chloride possibly used as a carrier for precipitation, and chromium trioxide used in chromic acid baths to clean metal surfaces, although this chromic acid solution would not be in the radioactive waste stream; chromium metal on a Room 1211 inventory; chromium trioxide on a Room 1142 inventory; and chromium on Experimental Request Forms

Based on this information, the D007 hazardous waste number has been assigned to the waste stream.

Lead (D008)

The D008 hazardous waste number was specifically listed as a potential contaminant for Building 332 TRU waste. Also, the following uses for lead and information on its presence in TRU waste were described by source documents: in leaded glovebox gloves or other leaded gloves; in gloveboxes in water or dilute acid and in chemical standards with concentrations 1-10 ppm; as bricks and gloves; in Room 1353 waste as lead bricks from decommissioning vapor plates, circa 1985; occasional disposal of lead "pigs" used to store sealed radioactive sources; listing in a 1968 building chemical inventory; as lead acetate and 24% lead naphthenate in a chemical inventory; and used as shielding in some containers. Lead pigs and bricks were identified in some containers by LLNL RTR efforts. Circuit boards could also be in the waste, which may be expected to add some lead.

Lead was listed in some source documents that provide general information about potential contaminants at LLNL, including its use as shielding in some containers and presence in excess of the toxicity characteristic regulatory level in leaded gloves and glovebox windows. The D008 hazardous waste number was specifically listed as a potential contaminant for Building 251 TRU waste. Also, the following uses for lead and information on its presence in TRU waste were described by source documents: lead pigs used as containers for radioactive materials; lead bricks for shielding before 1986-87; leaded gloves and lead bricks; lead and lead oxide on a Room 1142 chemical inventory; lead for shielding and in leaded glass windows in neutron-shielded cells and cave units; sealed lead capsules covering tracer "slugs; and lead listed on Experimental Request Forms.

Considering the multiple uses described for lead and the lack of information excluding lead or providing quantitative data to the contrary, the hazardous waste number, D008, has been assigned to the waste stream.

Mercury (D009)

Mercury was listed in some source documents that provide general information about potential contaminants at LLNL. More specifically, the D009 hazardous waste number was listed as a potential contaminant for Building 332 TRU waste. The following uses or presence/absence information for mercury in Building 332 TRU waste was described by source documentation: possibly in fluorescent light fixtures disposed as TRU waste; as mercury solution in a chemical inventory; and listed in a 1968 building chemical inventory.

The following uses or presence information for mercury in Building 251 TRU waste was described by source documentation: mercuric and mercurous nitrates and mercury used in manometers, barometers, and diffusion pumps; lead shielding in non-powder form; mercury and mercuric and mercurous nitrates on a Room 1142 chemical inventory; and mercury-contaminated paper/plastic described as acceptable at a building waste accumulation area.

Based on this information, the D009 hazardous waste number has been assigned to the waste stream.

Selenium (D010)

Selenium was listed in one source document as being present in LLNL TRU waste. More specifically, the D010 hazardous waste number was specifically listed as a potential contaminant for Building 332 TRU waste and as metal powder in a building chemical inventory.

Specific to Building 251, selenium metal was listed on a Room 1142 inventory and selenium-contaminated paper/plastic waste was specifically mentioned as acceptable to be stored at a building waste accumulation area.

Based on this information, the hazardous waste number, D010, is applied to the waste stream.

Silver (D011)

Silver was listed in some source documents that provide general information about potential contaminants at LLNL. The D011 hazardous waste number was also specifically listed as a potential contaminant for Building 332 TRU waste and the following uses for silver in Building 332 and/or its possible presence in TRU waste was indicated: in Room 1354 as solder associated with soldering fluxes; listed in a 1968 building chemical inventory and a 1992 chemical inventory database query; and in Vault 1314A used during metal recovery and packaging of solid. Circuit boards could also be in the waste, which may be expected to add some silver.

The D011 presence in Building 251 TRU waste is described in the source documents: silver solder on soldering tips; silver oxide possibly rarely used as a precipitate; silver (Ag^{+2}) oxide as an oxidizing agent; silver oxide on a Room 1211 inventory; in "Silver Goop" listed on a chemical tracking database; and silver-contaminated paper/plastic was noted as acceptable for storage at a building waste accumulation area.

Based on this information, the D011 hazardous waste number has been assigned to the waste stream.

Carbon tetrachloride (D019)

Carbon tetrachloride was identified in the Building 332 and 251 chemical inventories. Carbon tetrachloride was used in the metallography laboratory as a lubricant and in liquid-liquid extraction. Although previous assignments of F001 as a spent solvent have been used for Carbon tetrachloride, lubrication does not constitute solvent use and metallography was the only process identified which used Carbon tetrachloride.

Since there are no data indicating the definitive concentration of the compound EPA Hazardous waste number D019 has been assigned to the waste stream.

Chloroform (D022)

Chloroform was used as a reagent in the analytical laboratory in Building 332 and was also added to contaminated oil allowing it to pass through filter paper prior to being solidified. There are no data to indicate the concentration of this constituent in the waste stream. Chloroform was identified in the Building 251 chemical inventory and was possibly used in liquid-liquid extraction prior to the mid 1980s. This process used chloroform in quantities of 25-30 milliliters (ml); however, there are no data to indicate the concentration of this constituent in the waste.

Therefore, EPA hazardous waste number D022 has been applied to the waste stream.

1,4-Dichlorobenzene (D027)	Building 332
1,2-Dichloroethane (D028)	Buildings 332 and 251
1,1-Dichloroethylene (D029)	Building 332
Trichloroethylene (D040)	Buildings 332 and 251

1,4-dichlorobenzene (D027), 1,2-dichloroethane (D028), 1,1-dichloroethylene (D029) and trichloroethylene (D040) were also identified in Buildings 251 and 332 as indicated above. Specific sources for these organic compounds have not been identified. These toxicity characteristic contaminants were identified in the documentation; however, there is no data to indicate the concentration of these constituents. 1,2-Dichloroethane was detected in Building 251 waste. Therefore, EPA hazardous waste numbers, D027, D028, D029 and D040 are applied to this waste stream.

Listed Waste

The material in this waste stream was mixed with or derived from the treatment of a waste listed in 40 CFR 261, Subpart D as a hazardous waste from non-specific sources. Several information sources specify F001, F002, F003, F004 and F005-listed solvents being used or present in Building 332, Building 251 or in the waste from these buildings. Therefore, EPA hazardous waste numbers F001, F002, F003, F004 and F005, as itemized below, are assigned to the wastes generated from Buildings 251 and 332. The following chemicals used in Building 251 and/or 332 require the application of the following F hazardous waste numbers to this waste stream. Additional information is available in Sections 6.4.3[A] and 5.4.3 [A] of the AK document.

(F001)

Carbon tetrachloride, Dichlorodifluoromethane, Freon, Methylene chloride, PCE/tetrachloroethylene, Trichloroethylene, 1,1,1-Trichloroethane

(F002)

Chlorobenzene, Carbon tetrachloride, Freon, Methylene chloride, PCE/tetrachloroethylene, Trichloroethylene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane

(F003)

Acetone, n-Butanol, Cyclohexanone, Ethyl acetate, Ethyl benzene, Ethyl ether, Methyl isobutyl ketone, Methanol, Xylene

(F004)

Nitrobenzene

(F005)

Benzene, Carbon disulfide, Isobutanol, Methyl ethyl ketone, Pyridine, and Toluene

The material in this waste stream is not hazardous waste from specific sources since it was not generated from any of the processes listed in 40 CFR 261.32 nor does it consist of discarded chemical products, off-specification compounds, container residues or spill residue listed in 40 CFR 261.33. The material in this waste stream is therefore not a K-listed waste or U- or P-listed.

Summary

The waste may exhibit the characteristic for toxicity for arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, carbon tetrachloride, chlorobenzene, chloroform, 1,4-dichlorobenzene, nitrobenzene, pyridine, and tetrachloroethylene. The waste was mixed with or derived from the treatment of halogenated and nonhalogenated solvents, and is therefore F-listed. EPA hazardous waste numbers applicable to the waste are: D004, D005, D006, D007, D008, D009, D010, D011, D019, D022, D027, D028, D029, D040, F001, F002, F003, F004, and F005.

Polychlorinated Biphenyls

The presence of polychlorinated biphenyls (PCBs) in TRU waste generated at LLNL and stored at the NTS has been evaluated. PCBs were identified in LLNL waste. However, no direct evidence of PCB-contaminated TRU waste was identified. X-ray fluorescent equipment containing PCBs as coolant was disposed as low level waste. Within the last few years, transformers and lamp ballasts known to contain PCBs were disposed of as non-radioactive waste. To ensure waste generated prior to 1983 (when PCBs were segregated from the waste at LLNL) does not contain PCBs, transformers, capacitors, and lamp ballasts will be managed as prohibited items when identified by radiography or VE.

Physical Form

Wastes from this waste stream include paper, plastic, glassware, ceramics and metals, as well as solidified liquids or sludges. Specific waste items include: Kimwipes, cotton wipes, swabs, tissues, grinding paper, plastic labware and glovebox windows, glass beakers, Neoprene and Hypalon gloves, hardware, tools and equipment, aluminum and lead foil, copper hardware, aerosol cans, graphite molds, magnesium oxide and tantalum crucibles, epoxy resin chunks, and solidified aqueous or organic liquids. Further information is available in Sections 5.4.2 and 6.4.2 of CCP-AK-NTS-001, Revision 5.

Prohibited Items

This waste stream undergoes 100% RTR. Visual examination is used as a quality control check of the RTR process. This process is used to determine that the containers do not include any prohibited items.

Headspace Gas/Volatile Organic Compound Information

The lot from waste stream NTLLNL-S5400-MIX1 (identified as Lot 5) consists of 2 55-gallon drums. One tentatively identified compound (TIC) was identified in this lot. This compound (Diisopropyl ether) is listed in the Headspace Gas Summary Report Attachment 4 and Attachment 5. This TIC was found in 50% of the containers in this lot. The TIC is not listed in Appendix VIII of 40 CFR Part 261.

The UCL₉₀ calculated values of all of the Target Analytes are below the program required quantification limits (PRQLs). Specific information about the maximum, mean, standard deviation and UCL₉₀ are contained in the Headspace Gas Summary Report.

Radionuclide Information

The two most prevalent isotopes expected from the NTLLNL-S5400-MIX1 waste stream are Pu-239 at 92.7% and Pu-240 at 6.34%.

Weapons-grade plutonium was the primary radioactive material in Building 332 and was used in nearly every operation. Other grades of plutonium include fuel-grade, reactor-grade, mixed-grade and americium-enriched.

The expected isotopic composition of weapons-grade plutonium is:

Pu-238:	0.01 – 0.02 wt %
Pu-239:	93.2 – 94.1 wt %
Pu-240:	5.71 – 6.26 wt %
Pu-241:	0.10 – 0.40 wt %
Pu-242:	0.02 – 0.05 wt %
Am-241:	0.05 – 0.44 wt %
Np-237:	0.00 – 0.04 wt %

Other grades of plutonium that are present in the waste stream are delineated on a drum by drum basis and contain varying amounts of Pu-240. Reactor-grade plutonium contains > 12 wt % Pu-240 and ~1% Am-241. Americium-enriched plutonium contains < 15 wt % Pu-240 and 1 to 25 wt % Am-241. Mixed-grade plutonium contains 15 to 50 wt % Pu-240 and 1-25 wt % Am-241. Fuel grade plutonium contains 6-12 wt % Pu-240 and < 1% Am-241.

The drums from Building 332 originated from Lawrence Livermore National Laboratory. The AK provided for these drums indicate that the maximum gram loading for beryllium in any one drum is 0.002 grams. Therefore, the total quantity of beryllium in any drum from this waste stream will not exceed 1%. No drum or 14 drum payload configuration will present a criticality issue with regards to beryllium. Beryllium was used as a target substrate in Building 251; however, beryllium from this source was not discarded as waste.

Building 251 usually handled TRU isotopes other than plutonium 239. Also used was calorimetry gamma counting to determine isotopic and total TRU content. Some weapons-grade plutonium was processed in Building 251, but was not typical. More than 90 percent of the wastes originating in Building 251 were generated during preparation of diagnostic tracers. The two most prevalent isotopes present in the Building 251 waste are expected to be Pu-239 at 91.4% and Pu-240 at 5.63%.

The radionuclides listed on the following Table (Radionuclides) have been identified as being present in Building 332, Building 251 or in waste from those buildings and may be expected in the waste as indicated in Sections 5.4.2, 6.4.2 and 10.4.2 of the AK Summary Report.

Newly Generated Waste

This waste stream does not include any newly generated waste.

Radionuclides

Americium	241	243	242m	243		
Antimony	125					
Berkelium	249	247				
Bismuth	212	213				
Californium	249	250	252			
Cesium	137					
Cobalt	56	60				
Curium	242	243	244	246	248	245
Europium	152	154	155			
Krypton	85					
Manganese	54					
Neptunium	237	239	238			
Plutonium	236	238	239	240	241	242
Thorium	228					
Strontium	90					
Uranium	232	233	234	235	238	
Thallium	208					
Tungsten	187					
Actinium	223	227	225			
Lead	212					
Palladium	Unknown isotope					
Sodium	22					
Radon	219	222				
Mixed fission products	Not specified					

Tritium	H-3					
Thorium	228	229	230	232		
Einsteinium	254					
Francium	221					
Gadolinium	148					
Germanium	68					
Nickel	63					
Plutonium	238	239	240	241	242	244
Protactinium	231					
Radium	223	224	225			
Samarium	151					
Strontium	90					
Uranium	232	233	234	235	236	238

Waste Stream Profile Narrative NTS54MIX1R0
Attachment

Source Doc. No.	Document Number	Title	Author	Date
C043L		TRU Waste Generator Interview Sheet No. 91-4-3-5. Interview of Willis Haugen	Kern Hainebach, Dan Hoyt	April 3, 1991
C046L		TRU Waste Generator Interview Sheet No. 91-4-4-2. Interview of Tom Schroeder	Kern Hainebach	April 4, 1991
C054L		TRU Waste Generator Interview Sheet No. 91-4-5-4. Interview of Jerry Landrum	Kern Hainebach	April 5, 1991
C055L		TRU Waste Generator Interview Sheet No. 91-4-8-1. Interview of Sharon Schumacher and Dave Parks	Kern Hainebach, Dan Hoyt, Bob Fischer	April 8, 1991
C057L		TRU Waste Generator Interview Sheet No. 91-4-8-3. Interview of Vic Elliot	Kern Hainebach	April 8, 1991.
C059L		TRU Waste Generator Interview Sheet No. 91-4-8-5. Interview of Allen Lingenfelter	Kern Hainebach	April 8, 1991
C061L		TRU Waste Generator Interview Sheet No. 91-4-10-1. Interview of Mel Coops	Kern Hainebach	April 10, 1991
C064L		TRU Waste Generator Interview Sheet No. 91-4-18-1. Interview of Bill Poulos	Kern Hainebach	April 18, 1991
C067L		Memo: Recertification of TRU Waste from B-332 Stored at Hazardous Waste Management	A.A. Garcia	February 15, 1991
C069L	HWMS 91-44	Memo: Waste Generator Interviews to Assess LLNL TRU Inventory at NTS	Kern Hainebach	March 28, 1991
C070L	HWMS 91-36	Memo: Waste Generator Interviews to Assess LLNL TRU Inventory at NTS	Kern Hainebach	March 11, 1991
C073L		Internal correspondence to Susi Jackson: Confirmation of TRU Waste Characterization	Kern Hainebach	July 17, 1996
C075L		Interview Notes of Kern Hainebach, LLNL: General Discussion of TRU Wastes Generated at LLNL and Stored at NTS	Jeff Harrison, WASTREN, Inc.	November 19, 1997
C076L		Interview Notes of Joe Schmitz, Dan Hanson, Jim Harter, and Joseph Magana, LLNL: Discussion of TRU Operations and Waste Generated in Building 332	Jeff Harrison	November 20, 1997
C077L		Interview Notes of Lyle Kerns, LLNL: General Discussion of TRU Operations at LLNL	Jeff Harrison, WASTREN, Inc.	November 20 - 21, 1997
C078L		Telecon Form: Call to Wes Hayes, LLNL: General Discussion of Operations in Building 251 at LLNL	Jeff Harrison, WASTREN, Inc.	November 23, 1997
C086L		Facsimile Transmission to Jeff Harrison, WASTREN, Inc.	Joe Magana, LLNL	March 10, 1998
C089L		Acceptable Knowledge Interview Notes of Jerry Landrum, LLNL	Jeff Harrison, WASTREN, Inc.	February 26, 1998
C090L		Acceptable Knowledge Interview Notes of Rich Burns, LLNL	Jeff Harrison	February 24, 1998
C091L		Acceptable Knowledge Interview Notes of Jean Lindsey, LLNL	Jeff Harrison, WASTREN, Inc.	February 24, 1998
C092L		Acceptable Knowledge Interview Notes of Frank Beckell and Dick Dickinson	Jeff Harrison, WASTREN, Inc.	February 25, 1998
C093L		Acceptable Knowledge Interview Notes of Ted Midtaune, LLNL	Jeff Harrison, WASTREN, Inc.	February 25, 1998
C094L		Acceptable Knowledge Interview Notes of Charles M. (Skip) Peters, LLNL	Jeff Harrison, WASTREN, Inc.	February 25, 1998
C095L		Acceptable Knowledge Interview Notes of Bill Poulos, LLNL	Jeff Harrison, WASTREN, Inc.	February 25, 1998
C096L		Acceptable Knowledge Interview Notes of Joe Schmitz, LLNL	Jeff Harrison, WASTREN, Inc.	February 26, 1998

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Attachment

Source Entry No.	Document Number	Title	Author	Date
C097L		Acceptable Knowledge Interview Notes of Jim Harter and Bob Gomez, LLNL	Jeff Harrison, WASTREN, Inc.	February 26, 1998
C098L		Acceptable Knowledge Interview Notes of Terry Ludlow, LLNL	Jeff Harrison, WASTREN, Inc.	February 26, 1998
C099L		Acceptable Knowledge Interview Notes of Joe Magana, LLNL	Jeff Harrison, WASTREN, Inc.	February 27, 1998
C100L		Telecon Form: Call to Doug McAvoy, LLNL. "Building 332 Materials Process Lab (MPL) Operations."	Jeff Harrison, WASTREN, Inc.	February 27, 1998
C102L		Telecon Form: Call to Jerry Landrum, LLNL, "Chemical Usage in Building 251."	Jeff Harrison, WASTREN, Inc.	March 26, 1998
C103L		Telecon Form: Call to Jerry Landrum, LLNL, "Follow-up to March 26, 1998 Conversation with Mr. Landrum (see C102L)."	Jeff Harrison, WASTREN, Inc.	April 3, 1998
C105L		Telecon Form: Call to Doug McAvoy, LLNL, "Hydriding/Dehydriding Operations."	Jeff Harrison, WASTREN, Inc.	April 15, 1998
C107L		Telecon Form: Call to Lyle Kems, LLNL: Completion of NTS Shipping Record	Jeff Harrison, WASTREN, Inc.	May 1, 1998
C108L		Telecon Form: Call to Ted Midtaune, LLNL: Radioactive Sources	Jeff Harrison, WASTREN, Inc.	October 12, 1998
C109L		Telecon Form: Call to Jerry Landrum, LLNL: Building 251 Process Information	Jeff Harrison, WASTREN, Inc.	October 13, 1998
C110L		Telecon Form: Call to Tom Schroeder, LLNL: Building 332 Process Information	Jeff Harrison, WASTREN, Inc.	October 13, 1998
C112L		Acceptable Knowledge Interview Notes. Interview of Joe Magana, LLNL	Mike Griffin, Bechtel, Nevada	May 26, 1999
C113L		Memorandum: Waste Parameter Determination for LLNL TRU Waste	Jeff Harrison, WASTREN, Inc.	September 27, 1999
C114L		Miscellaneous Correspondence	Jeff Harrison, Scott Smith, Mike Griffin, Bruce Foster, Marlin Horsman, Richard Blauvelt, Al Celoni	August to November 1999
C116L		Memorandum to Gary Tompkins, LLNL: Preparation of Pu-239 Chloride and Nitrate Stock Solutions for Soil/Plant Uptake Studies	Joseph Magana, LLNL	November 7, 1974
C128L		Telecon Form: Call to Rodney Hollister, LLNL: AK Investigation of LLNL TRU Waste Streams Stored at the Nevada Test Site	David Guerin, LANL, Carlsbad Operations	August 21, 2002
P007L	HWM Procedure Number 201	TRU Container Procurement Operating Procedure	LLNL	June 25, 1986
P008L	HWM Procedure Number 202	TRU Container Inspection and Control Operating Procedure	LLNL	May 22, 1986
P009L	HWM Procedure Number 203	TRU Waste Shipment Preparation Operating Procedure	LLNL	May 31, 1986
P010L	HWM Procedure Number 203	TRU Waste Shipment Preparation Procedure, Revision 2	LLNL	July 27, 1989
P011L	HWM Procedure Number 204	TRU Waste Package Shipment Operating Procedure	LLNL	June 23, 1986
P012L	HWM Procedure Number 205	TRU Nonconformance Reports and Corrections Operating Procedure	LLNL	August 14, 1986
P018L	FSP 612	Facility for Processing of Hazardous Wastes	LLNL	July 18, 1983

Waste Stream Profile Number NTS54MIX1R0
Attachment

Source Doc No.	Document Number	Title	Author	Date
P019L	Operational Safety Procedure 332	Operational Safety Procedures: Plutonium Metallurgy and Engineering Facility, Building 332	LLNL	April 1975 to June 30, 1980
P020L	Operational Safety Procedure 332.3	Temporary Work Stations, Plutonium Engineering Facilities	LLNL	December 29, 1976
P021L	Operational Safety Procedure 332.5	Plutonium Waste Recovery and Packaging, Room 1378	LLNL	December 1981
P022L	Operation Safety Procedure 332.11	Analytical Chemistry Operations, Room 1329	LLNL	October 1980
P024L	Query to LLNL Filemaker Pro "NEWTR.FM"	NTS TRU Waste Inventory Details	LLNL	December 10, 1996
P025L	NTS database report in file "TRU_WST.TX T"	NTS TRU Waste Inventory Data	Bechtel Nevada.	November 18, 1997
P027L	M-158	Facility Training Program Heavy Element Facility, Building 251, Nuclear Chemistry Division	J. Landrum	March 1, 1985.
P029L	M-158	Heavy Element Facility (Building 251) Handbook, Nuclear Chemistry Division, Revision 1	Nuclear Chemistry Division, LLNL	March 1986
P030L	DOE/LLW-217	DOE Waste Treatability Group Guidance, Revision 0	Radioactive Waste Technical Support Program, T.D. Kirkpatrick, INEEL	January 1995
P031L		Interim Guidance on Ensuring that Waste Qualifies for Disposal at the Waste Isolation Pilot Plant	DOE Carlsbad Area Office.	February 13, 1997
P033L	PB94-963603, OSWER 9938.4-03	Waste Analysis At Facilities that Generate, Treat, Store, and Dispose of Hazardous Wastes: A Guidance Manual	United States EPA Solid Waste and Emergency Response, USEPA	April 1994
P034L	R-6157	Guidance For Preparing Transuranic Waste Sampling Plans	Lockheed Idaho Technologies Company and Benchmark Environmental Corporation for the DOE, Carlsbad Area Office	February 1996.
P035L	CAO-94-1010	Transuranic Waste Characterization Quality Assurance Program Plan, Interim Change	US DOE, CAO.	November 15, 1996
P038L	FSP-332	Facility Safety Procedure, Plutonium Facility-- Building 332, Revision 3	LLNL	June 1989
P039L	M-246	LLNL Plutonium Facility B332 Operations Manual for Maintenance/Operations Department	LLNL	January 26, 1990
P040L	UCRL-AR- 113377	Safety Analysis Report for the Heavy Element Facility (Building 251)	LLNL	September 30, 1994
P041L	FSP-251	Facility Safety Procedures, Heavy Element Facility Building 251	LLNL	July 1993
P043L	MM-03	Procedure for TRU Waste Solidification	T. Midtaune, Materials Management, LLNL	November 2, 1986
P044L	MM-03	Procedure for TRU Waste Solidification	T. Midtaune, Materials Management, LLNL	February 19, 1987
P045L	UCRL-51590	Safety Analysis Report for Building 332	LLNL	June 20, 1974

Waste Stream Profile Number NTS54MIX1R0
Attachment

Source Design No.	Document Number	Title	Author	Date
P046L	UCID-17565	Final Safety Analysis Report (FSAR) for Building 332, Increment III.	B.N. Odell, A.J. Toy Jr.	August 31, 1977.
P048L	OSP 332.39	Operational Safety Procedure for Analytical Laboratory Room 1321, 1321A; Workstations #2101, #2105 and #2106	J. Magana, LLNL	November 1, 1996
P049L	UCRL-ID-127458	TRU Waste from the Superblock	T.T. Coburn, LLNL, downloaded from LLNL Library Internet site.	May 27, 1997
P050L	OSP 332.17	Operational Safety Procedure for Metallography Laboratory, Room 1322, 1322A & 1322B; Workstations #2201 and #2202	LLNL	June 1, 1993
P051L	UCID-20276	LLNL Radioactive Waste Management Plan as per DOE Order 5820.2	LLNL	December 10, 1984
P052L	UCRL-LR-107105	Molten Salt Extraction (MSE) Salt Cleanup	T.W. Crawford, D.P. McAvoy, LLNL	April 1991
P053L	UCRL-92693	Formation of Pu Amorphous Alloys or Metastable Structures in Pu-Fe, Pu-Ta, and Pu-Si Alloys	H.F. Rizzo, A.W. Echeverria, LLNL	August 20, 1985
P054L	UCRL-92692	Loss of Ga in Sputtered Deposits Made from a Pu at % Alloy	H.F. Rizzo, E.D. McClanahan, D.S. Margolies, A.W. Echeverria, LLNL	November 15, 1985
P055L	UCRL-88116	Technology Review Report, Pyrochemical Processing of Plutonium	M.S. Coops, J.B. Knighton, and L.J. Mullins, LLNL	September 8, 1982
P056L	UCID-20016	Evaluation of Nonaqueous Processes for Nuclear Materials, Task Report to the Long-Range Planning Committee	B.C. Musgrave, J.Z. Grens, J.B. Knighton, M. S. Coops, LLNL	December 1983
P057L	UCRL-93272	Glovebox Enclosed D.C. Plasma Source for the Determination of Metals in Plutonium	W.F. Morris	January 15, 1986.
P058L	UCRL-ID-104929	Tensile Testing at High Temperatures in a Glovebox	M.P. Stratman	October 1, 1990
P061L		Radioactive Waste Information System Users' Manual	Reynolds Electrical & Engineering Company, Inc	October 1982.
P062L		Material Safety Data Sheets (MSDSs) and Technical Data.		
P063L	WCP-20	Management of TRU Waste by TRU Waste Generators, Revision 0	LLNL	September 8, 1995
P064L	WCP-21	Certification of Transuranic Waste Packages, Revision 1	LLNL	November 20, 1998
P065L	WCP-14	Process Knowledge Evaluation for Facility-Specific Waste Streams, Revisions 0 and 1	LLNL	August 1993, June 1994, December 1995
P066L	UCRL-AR-119486	Transuranic Waste Characterization Quality Assurance Project Plan, Revision 0	LLNL	September 15, 1997
P068L	TIP-HEF-010	Gamma Ray Spectrometry of Waste Parcels Procedures. Technical Implementing Procedure	LLNL	June 8, 1993
P069L	TIP-HEF-024	Gamma Ray Spectrometry of Waste Parcels Procedure: Heavy Element Facility, Quality Operating Procedure	LLNL	June 5, 1995
P070L	TIP-HEF-008	Waste Acceptance Criteria (WAC) Procedures: Technical Implementing Procedure	LLNL	July 28, 1993
P076L	HWM Procedure 216	Building 419 TRU Waste Verification Operating Procedure	LLNL	December 10, 1986
P077L	OSP 419.12	Installation of Vent Clips in TRU Waste Drums at Building 419	LLNL	October 22, 1986 and November 13, 1987

Source No.	Document Name	Title	Author	Date
P079L	OSP 612.2	Handling and Incinerating Carcinogens	LLNL	April 19, 1984
P080L	OSP 612.6	Waste Compactor/Bailer	LLNL	October 28, 1987
P081L	OSP 612.12	Transferring Outdated Ether to Site 300	LLNL	February 1, 1988
P082L	OSP 612.13	Building 624 Incinerator Trial Burn	LLNL	February 25, 1988
P083L	OSP 612.16	Bulking of Aqueous Wastes	LLNL	May 1991
P084L	OSP 612.17	Bulking of Identical or Nearly Identical Materials	LLNL	May 1991
P085L	M-158, Appendix F 1.0	Heavy Element Facility (Building 251) Handbook Appendix F, Procedures 1.0 and 1.1, Air Transfers of Radioactive Materials, Revisions 1 and 1.1	Nuclear Chemistry Division, LLNL	June 5, 1987
P086L	M-158	Heavy Element Facility (Building 251) Handbook Appendix F, Procedure 5.1, Liquid Waste Solidification, Revision 1	Nuclear Chemistry Division, LLNL	December 9, 1986
P087L	HWM Procedure 202	HWM Management of TRU Containers, Revision 3	LLNL	March 12, 1999
P088L	L-E10.303.LAA	Nevada Test Site Waste Management Program Health and Safety Program Plan. Attachment C: Site-Specific Health and Safety Plan - Area 5 TRU Pad, Revision 3	Waste Management Division Nevada Test Site.	April 20, 1998
P089L	L-E 10.344.LWC	Waste Management Program Site-Specific Health and Safety Plan Transuranic Waste Characterization Project Waste Examination Facility Area 5 Nevada Test Site, Revision 3	Bechtel Nevada Waste Management Program	December 1, 1998
P090L	L-E10.333.LWC	Management Plan for the Transuranic (TRU) Pad Cover Building (TPCB) at the Area 5 Radioactive Waste Management Site (RWMS)	Bechtel Nevada Waste Management Program.	June 9, 1998
P095L	OP-2151.402	TRU Waste Examination, Segregation, and Repacking, Revision 2	Bechtel Nevada	June 25, 2001.
P096L		TRU Tracking System User Guide	Bechtel Nevada Waste Management Department	June 1998
P097L	OP-2151.402 / CCP-TP-062	TRU Waste Visual Examination, Segregation, and Repacking, Revision 5	Bechtel Nevada	April 5, 2002
U003L		Data Bases used for the Inventory Assessments of the TRU Drums Stored at DOE's Nevada Test Site (1974-1990)	Lawrence Livermore National Laboratory	March 13, 1991
U007L	HWM Procedure No. 215	Building 419 TRU Waste Verification	Lawrence Livermore National Laboratory	December 1, 1986
U008L		Miscellaneous Building 612 LLNL Waste Management Procedures	Lawrence Livermore National Laboratory	
U012L	LLNL	Instructions for Solidification of Hydrocarbons, Oil and Plutonium Mixed, and Solidification of Acid	Ted Midtaune	
U013L		Safety Analysis Report for The Heavy Element Facility (Building 251)	Lawrence Livermore National Laboratory, Donald J. Kvam, UCID-19579	October 11, 1982
U016L		Excerpts from Nevada Test Site Shipping Records	Lawrence Livermore National Laboratory	1974-1986
U017L	LLNL	Room Logbooks		June 1986 to September 1992

Spill ID #	Document Number	Title	Author	Date
U019L		Total Waste Management System (TWMS) Database Information, TRU Container Inventory Query in Excel Spreadsheets	Lawrence Livermore National Laboratory	1999
U024L		ChemTrack Database. Building 251, 332, 419 Chemical Inventory Queries Output to Excel Spreadsheets	Lawrence Livermore National Laboratory	November 1992
U025L	MM-03	Building 332 TRU Waste Solidification Procedure, Revision 0	Lawrence Livermore National Laboratory	April 8, 1992
U029L		Building 612 Radioactive Waste Logbooks	Lawrence Livermore National Laboratory	1974 - 1985
U034L	HWM SOP 612.1	Radioactive Low Specific Activity (LSA) Shipments to NTS, revision 0	Lawrence Livermore National Laboratory	November 1, 1985
U035L	HWM SOP 612.2	Procedure for Chemical Shipments (Bulk and Drummed Liquids), Revision 0	LLNL	October 1, 1985
U036L	HWM SOP 612.3	Thursday Waste Run, Revision 0	Lawrence Livermore National Laboratory	November 15, 1985
U037L		Incineration Procedure	LLNL	
U038L	HWM 612.4	Draft Procedure for Packing of "Labpacks"	LLNL	
U046L	UCRL MI 138019	Building 231 Documentation Notes	LLNL	October 25, 1968 to June 1989
U051L		TRU Waste Packing Log	Bechtel Nevada	June 25, 2002
U052L	OI-2151.401	TRU_DS Database Information and TRU_DS User's Guide, Version 5.0	Bechtel Nevada	Sept. 2000 (Guide), July 2002 (database download)
U053L		NTS Inventory Tracking Sheet, revision 5	Shaw Environmental and Infrastructure, Inc., LANL Carlsbad	September 26, 2002
U055L		Analysis of NTS Radioassay Data for LLNL TRU Waste	David Guerin, LANL, Carlsbad Operations	September 17, 2002

CHARACTERIZATION INFORMATION SUMMARY

Waste Stream NTLLNL-S5400-MIX1; Lot 5

Waste Stream Profile Number NTS54MIX1R0

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WSP: # NTS54MIX1R0Lot #: 5AK Expert Review: John Whitworth Date: 6/30/03STR Review (if necessary): R. J. Wood Date: June 29, 03SPQAO Review: A. J. Finer Date: 6/30/03SPM Review: Cornell Date: 30 June 03

SPQAO signature indicates that the information presented in this package is consistent with analytical batch reports.

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

RADIOGRAPHY:

CCP-TP045, Rev 6, CCP RTR #5 Radiography Inspection Operating Procedures, January 31, 2003

CCP-TP045, Rev 5, CCP RTR #5 Radiography Inspection Operating Procedures, November 20, 2002

CCP-TP045, Rev 4, CCP RTR #5 Radiography Inspection Operating Procedures, September 18, 2002

CCP-TP045, Rev 3, CCP RTR #5 Radiography Inspection Operating Procedures, March 20, 2002

CCP-TP045, Rev 2, CCP RTR #5 Radiography Inspection Operating Procedures, December 10, 2001

VISUAL EXAMINATION:

CCP-TP-061, Rev 4, CCP TRU Waste Visual Examination, Segregation and Repacking, May 21, 2002

CCP-TP-061, Rev 3, CCP TRU Waste Visual Examination, Segregation and Repacking, February 11, 2002

HEADSPACE GAS ANALYSIS:

CCP Characterization Information Summary Cover Page

CCP-TP-007, Rev 16, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, February 3, 2003
CCP-TP-007, Rev 15, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, October 18, 2002
CCP-TP-007, Rev 14, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, September 26, 2002
CCP-TP-007, Rev 13, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, September 4, 2002
CCP-TP-007, Rev 12, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, July 23, 2002
CCP-TP-007, Rev 11, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Procedure, January 28, 2002
CCP-TP-009, Rev 11, CCP Single Sample Manifold Data Handling Procedure, February 5, 2003
CCP-TP-009, Rev 10, CCP Single Sample Manifold Data Handling Procedure, September 26, 2002
CCP-TP-009, Rev 9, CCP Single Sample Manifold Data Handling Procedure, September 20, 2002
CCP-TP-009, Rev 8, CCP Single Sample Manifold Data Handling Procedure, January 30, 2002
CCP-TP-029, Rev 11, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, February 12, 2003
CCP-TP-029, Rev 10, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, October 18, 2002
CCP-TP-029, Rev 9, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, September 26, 2002
CCP-TP-029, Rev 8, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, September 20, 2002
CCP-TP-029, Rev 7, CCP Single Sample Manifold Headspace Gas Sampling and Analysis Methods and Equipment Calibration, January 30, 2002
CCP-TP-032, Rev 10, CCP Single Sample Manifold Data Validation Procedure, February 3, 2003
CCP-TP-032, Rev 9, CCP Single Sample Manifold Data Validation Procedure, October 1, 2002
CCP-TP-032, Rev 8, CCP Single Sample Manifold Data Validation Procedure, September 26, 2002
CCP-TP-032, Rev 7, CCP Single Sample Manifold Data Validation Procedure, September 20, 2002
CCP-TP-032, Rev 6, CCP Single Sample Manifold Data Validation Procedure, January 29, 2002

RADIOASSAY:

CCP-TP-051, Rev 5, CCP Mobile Segmented Gamma Scanner Operation, September 19, 2002
CCP-TP-051, Rev 4, CCP Mobile Segmented Gamma Scanner Operation, July 12, 2002
CCP-TP-051, Rev 3, CCP Mobile Segmented Gamma Scanner Operation, January 29, 2002

DATA GENERATION REVIEW:

CCP-TP-052, Rev 5, CCP Mobile Segmented Gamma Scanner Data Reviewing, Validating and Reporting, January 22, 2003
CCP-TP-052, Rev 4, CCP Mobile Segmented Gamma Scanner Data Reviewing, Validating and Reporting, September 19, 2002

CCP Characterization Information Summary Cover Page

CCP-TP-052, Rev 3, CCP Mobile Segmented Gamma Scanner Data Reviewing, Validating and Reporting, July 19, 2002

CCP-TP-052, Rev 2, CCP Mobile Segmented Gamma Scanner Data Reviewing, Validating and Reporting, March 7, 2002

CCP-TP-052, Rev 1, CCP Mobile Segmented Gamma Scanner Data Reviewing, Validating and Reporting, March 6, 2002

CCP-TP-052, Rev 0, CCP Mobile Segmented Gamma Scanner Data Reviewing, Validating and Reporting, Sept. 20, 2001

PROJECT LEVEL DATA VALIDATION/DQO RECONCILIATION:

CCP-TP-001, Rev 8, CCP Project Level Data Validation, February 3, 2003

CCP-TP-001, Rev 7, CCP Project Level Data Validation, January 13, 2003

CCP-TP-001, Rev 6, CCP Project Level Data Validation, May 15, 2002

CCP-TP-001, Rev 5, CCP Project Level Data Validation, March 8, 2002

CCP-TP-001, Rev 4, CCP Project Level Data Validation, December 14, 2001

CCP-TP-002, Rev 13, CCP Reconciliation of DQOs and Reporting Characterization Data, June 27, 2003

CCP-TP-002, Rev 12, CCP Reconciliation of DQOs and Reporting Characterization Data, April 30, 2003

CCP-TP-002, Rev 11, CCP Reconciliation of DQOs and Reporting Characterization Data, October 24, 2002

CCP-TP-002, Rev 10, CCP Reconciliation of DQOs and Reporting Characterization Data, June 19, 2002

CCP-TP-002, Rev 9, CCP Reconciliation of DQOs and Reporting Characterization Data, June 6, 2002

CCP-TP-002, Rev 8, CCP Reconciliation of DQOs and Reporting Characterization Data, March 7, 2002

CCP-TP-002, Rev 7, CCP Reconciliation of DQOs and Reporting Characterization Data, February 18, 2002

CCP-TP-002, Rev 6, CCP Reconciliation of DQOs and Reporting Characterization Data, January 21, 2002

CCP-TP-003, Rev 13, CCP Sampling Design and Data Analysis for RCRA Characterization, June 28, 2003

CCP-TP-003, Rev 12, CCP Sampling Design and Data Analysis for RCRA Characterization, January 25, 2003

CCP-TP-003, Rev 11, CCP Sampling Design and Data Analysis for RCRA Characterization, January 20, 2003

CCP-TP-003, Rev 10, CCP Sampling Design and Data Analysis for RCRA Characterization, December 4, 2002

CCP-TP-003, Rev 9, CCP Sampling Design and Data Analysis for RCRA Characterization, October 10, 2002

CCP-TP-003, Rev 8, CCP Sampling Design and Data Analysis for RCRA Characterization, August 23, 2002

CCP-TP-003, Rev 7, CCP Sampling Design and Data Analysis for RCRA Characterization, June 3, 2002

CCP-TP-003, Rev 6, CCP Sampling Design and Data Analysis for RCRA Characterization, March 20, 2002

CCP Characterization Information Summary Cover Page

CCP-TP-003, Rev 5, CCP Sampling Design and Data Analysis for RCRA Characterization, March 18, 2002

CCP-TP-003, Rev 4, CCP Sampling Design and Data Analysis for RCRA Characterization, January 17, 2002

CCP-TP-030, Rev 8, CCP WWIS Data Entry and TRU Waste Certification, March 26, 2003

CCP-TP-030, Rev 7, CCP WWIS Data Entry and TRU Waste Certification, January 8, 2003

CCP-TP-030, Rev 6, CCP WWIS Data Entry and TRU Waste Certification, September 19, 2002

CCP-TP-030, Rev 5, CCP WWIS Data Entry and TRU Waste Certification, June 27, 2002

CCP-TP-030, Rev 4, CCP WWIS Data Entry and TRU Waste Certification, May 21, 2002

CCP-TP-030, Rev 3, CCP WWIS Data Entry and TRU Waste Certification, October 24, 2001

WAP CERTIFICATION:

CCP-PO-001, Rev 6, CCP Transuranic Waste Characterization Quality Assurance Project Plan, June 11, 2003

CCP-PO-001, Rev 5, CCP Transuranic Waste Characterization Quality Assurance Project Plan, February 5, 2003

CCP-PO-001, Rev 4, CCP Transuranic Waste Characterization Quality Assurance Project Plan, May 31, 2002

CCP-PO-001, Rev 3, CCP Transuranic Waste Characterization Quality Assurance Project Plan, January 14, 2002

CCP-PO-002, Rev 6, CCP Transuranic Waste Certification Plan, June 11, 2003

CCP-PO-002, Rev 5, CCP Transuranic Waste Certification Plan, February 12, 2003

CCP-PO-002, Rev 4, CCP Transuranic Waste Certification Plan, May 17, 2002

CCP-PO-002, Rev 3, CCP Transuranic Waste Certification Plan, January 21, 2002

CCP-PO-009, Rev 6, CCP NTS Interface Document, June 28, 2003

CCP-PO-009, Rev 5, CCP NTS Interface Document, October 25, 2002

CCP-PO-009, Rev 4, CCP NTS Interface Document, September 30, 2002

CCP-PO-009, Rev 3, CCP NTS Interface Document, September 18, 2002

CCP-PO-009, Rev 2, CCP NTS Interface Document, June 19, 2002

CCP-PO-009, Rev 1, CCP NTS Interface Document, January 23, 2002

CCP Correlation of Container Identification
Numbers to Batch Data Report Numbers

Page 1 of 1

CCP Correlation of Container Identification
Numbers to Batch Data Report Numbers

WSP: # NTS54MIX1R0

Lot #: 5

Container ID Number	On-Line Headspace Gas BDR	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes
NT980054	NTSND09	NTRTR0011	NT101502A	N/A	N/A	N/A	N/A
NT980055	NTSND17	NTRTR0011	NT061902A	N/A	N/A	N/A	N/A


Signature of Site Project Manager

Courtland Fesmire

Printed Name

30 June 03
Date

ADDITIONAL INFORMATION REGARDING THE CROSS-CORRELATION OF BDR NUMBERS

Headspace Gas Batch Data Reports(BDRs) are sequentially numbered by the date that the batch was run. For example:

NT050102A

1. The NT represents the Nevada Test Site
2. 05 indicates that the batch was run in May
3. 01 indicates that the batch was run on the first of May
4. 02 indicates the year – 2002
5. The A indicates that the "A" instrument was used.

This numbering system has remained unchanged during CCP operations at NTS.

NDA BDRs are sequentially numbered from 1 to 28. For example:

NTSNDA22

1. The NTS represents the Nevada Test Site
2. NDA represents the process--Non-destructive assay
3. The number represents the sequential number of the BDR

NDE BDRs are sequentially numbered from 1 to 54. The first NDE BDR was numbered as NTS-001. Each subsequent BDR was numbered as NTRTR0002. There maybe some variation in the number of zeros placed before the actual significant number.

1. The NT represents the Nevada Test Site
2. RTR represents the process--Radiography
3. The number represents the sequential number of the BDR

VE BDRs are sequentially numbered. The first two BDRs were numbered as NT-02-001 and NT-02-002. Subsequent BDRs were numbered as NT-VE-00003. Again there maybe some variation in the number of zeros placed before the actual significant number.

1. The NT represents the Nevada Test Site
2. VE represents the process—Visual Examination
3. The number represents the sequential number of the BDR

CCP-TP-003, Rev. 12
CCP Sampling Design and Data Analysis for
RCRA Characterization

Effective Date: 01/25/2003

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Attachment 2 - UCL₉₀ Evaluation Form

Page 1 of 2

WSPF #:	NTSSAMIX1R0	Waste Stream Lot Number: 5									
ANALYTE	Transform Data Used (No, Data-Log, SQT1, other)	# Samples	# Samples above MDL	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL ₉₀ (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL ₉₀ > PRQL Yes	EPA Code
Benzene	NO	2	0	2.54	1.95	0.83	0.89	10	N/A	NO	N/A
noform	NO	2	0	2.31	2.12	0.28	2.72	10	N/A	NO	N/A
Carbon tetrachloride	NO	2	0	2.32	1.77	0.77	3.45	10	N/A	NO	N/A
Chlorobenzene	NO	2	0	3.54	3.46	0.11	3.70	10	N/A	NO	N/A
Chloroform	NO	2	0	2.93	2.02	1.29	4.83	10	N/A	NO	N/A
Cyclohexane ^a	NO	0	0	2.16	1.43	1.04	3.69	10	N/A	NO	N/A
1,1-Dichloroethane	NO	2	0	2.62	1.98	0.91	3.95	10	N/A	NO	N/A
1,2-Dichloroethane	NO	2	0	1.64	1.45	0.27	2.03	10	N/A	NO	N/A
cis-1,2-Dichloroethylene	NO	2	0	3.15	1.72	2.01	6.10	10	N/A	NO	N/A
trans-1,2-Dichloroethylene	NO	2	0	2.16	1.40	1.07	3.72	10	N/A	NO	N/A
Ethyl benzene	NO	2	0	4.22	3.72	0.71	5.26	10	N/A	NO	N/A
Ethyl ether	NO	2	0	1.64	1.59	0.06	1.72	10	N/A	NO	N/A
Formaldehyde ^c	NO	0	0	2.65	1.96	0.97	4.07	10	N/A	NO	N/A
Hydrazine ^d	NO	2	0	4.28	2.90	0.57	4.14	10	N/A	NO	N/A
1,2,2,2-Tetrachloroethane	NO	2	0	3.30	2.73	1.15	5.22	10	N/A	NO	N/A
trachloroethylene	NO	2	0	3.54	0.99	0.74	1.51	10	N/A	NO	N/A
Toluene	NO	2	0	3.67	2.67	1.41	5.74	10	N/A	NO	N/A
1,1,1-Trichloroethane	NO	2	0	2.18	1.97	0.30	2.63	10	N/A	NO	N/A
Trichloroethylene	NO	2	0	2.18	1.97	0.30	2.63	10	N/A	NO	N/A
1,1,2-Trichloro-1,2,2-trifluoroethane	NO	2	0	2.18	1.97	0.30	2.63	10	N/A	NO	N/A
1,2,4-Trimethylbenzene ^a	NO	0	0	2.18	1.97	0.30	2.63	10	N/A	NO	N/A
1,3,5-Trimethylbenzene ^a	NO	0	0	2.18	1.97	0.30	2.63	10	N/A	NO	N/A

ANALYTE	Transform Data Used (No, Data- Log, SQRI, other)	# Samples	# Samples above MDL	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL ₉₀ (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL ₉₀ > PRQL Yes	EPA Code
m-Xylene ^b	NO	2	0	4.89	4.78	0.58	5.73	10	N/A	NO	N/A
p-Xylene ^b	NO	2	0	4.89	4.78	0.58	5.73	10	N/A	NO	N/A
o-Xylene	NO	2	0	4.41	3.92	0.70	5.44	10	N/A	NO	N/A
Arene	NO	2	1	23.90	17.01	9.74	38.21	100	N/A	NO	N/A
Butanol	NO	2	0	11.19	10.20	1.40	13.25	100	N/A	NO	N/A
Methanol	NO	2	0	21.47	17.02	6.30	30.72	100	N/A	NO	N/A
Methyl ethyl ketone	NO	2	0	12.11	9.08	4.28	18.40	100	N/A	NO	N/A
Methyl isobutyl ketone	NO	2	0	18.72	14.73	5.64	27.00	100	N/A	NO	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

^aThese compounds are from the TRAMPAC and are flammable VOCs that do not appear in the QAPP or the WIPP WAP. These are not part of the target analysis list, but samples may be analyzed for these compounds.

^bThese xylene isomers cannot be resolved by the analytical methods employed in the program. M-xylene and p-xylene will be reported as "Total m-p-Xylene."

^cRequired only for homogenous solids and soil/gravel waste from Los Alamos National Laboratory and Savannah River Site.

^dRequired only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.

Comments:

CCP Headspace Gas Summary Data

WSP: # NTS54MIX1R0

Lot (s) #: 5

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
Diisopropyl ether	108-20-3	1	50
<i>No further entries CAF 30 June 03</i>			

Data Confirms Acceptable Knowledge? Yes ☒ No ☐

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

Lot 5 WSPF NTS54MIX1R0

SPM Signature

Courtland Fesmire / Pamela A. Fesmire

Date: 30 June 03

Lot #: 5

30 June 03
Date

CCP Reconciliation with Data Quality Objectives

SPQAO Sampling CompletenessRTR:Number of valid samples: 2 Number of total samples analyzed: 2Percent Complete: 100 (QAO is 100%)NDA:Number of valid samples: 2 Number of total samples analyzed: 2Percent Complete: 100 (QAO is 100%)HSG:Number of valid samples: 2 Number of total samples collected: 2Percent Complete: 100 (QAO is $\geq 90\%$)Number of valid samples: 2 Number of total samples analyzed: 2Percent Complete: 100 (QAO is $\geq 90\%$)Total VOC:Number of valid samples: N/A (homogeneous solids not being sampled at this time) Number of total samples collected: N/APercent Complete: N/A (QAO is $\geq 90\%$)Number of valid samples: N/A Number of total samples analyzed: N/APercent Complete: N/A (QAO is $\geq 90\%$)Total SVOC:Number of valid samples: N/A (homogeneous solids not being sampled at this time) Number of total samples collected: N/APercent Complete: N/A (QAO is $\geq 90\%$)Number of valid samples: N/A Number of total samples analyzed: N/APercent Complete: N/A (QAO is $\geq 90\%$)Total Metals:Number of valid samples: N/A (homogeneous solids not being sampled at this time) Number of total samples collected: N/APercent Complete: N/A (QAO is $\geq 90\%$)Number of valid samples: N/A Number of total samples analyzed: N/APercent Complete: N/A (QAO is $\geq 90\%$)

SPQAO Signature and Date:

A.J. Fisher A.J. Fisher 6/30/03

I certify that sufficient data have been collected to determine the following Program-required waste parameters:

CCP Reconciliation with Data Quality Objectives

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Lot#: 5

	Y/N/NA	Reconciliation Parameter
1.	Y	Waste Matrix Code.
2.	Y (VE has not been performed on any of the containers in this batch)	Waste Material Parameter Weights.
3.	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4.	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5.	Y	<u>Potential Flammability.</u> Is there sufficient AK or analytical data to demonstrate that the waste meets the potential flammability limits (Headspace Gas, BDR and Summary Sheet)?
6.	Y	Mean concentrations, upper 90% confidence limit (UCL ₉₀) values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the headspace gas of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003-A3, and additional EPA Hazardous Waste codes were assigned as required. Samples were randomly collected (when appropriate).
7a.	N/A homogeneous solids not being analyzed in this waste stream	Mean concentrations, UCL ₉₀ values for the mean concentration, standard deviations, and the number of samples collected for total VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003-A4, and additional EPA Hazardous Waste codes were assigned as required. Samples were randomly collected.
7b.	N/A homogeneous solids not being analyzed in this waste stream	Mean concentrations, upper 90% confidence limit (UCL ₉₀) values for the mean concentration, standard deviations, and the number of samples collected for total SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003-A5, and additional EPA Hazardous Waste Codes were assigned as required. Samples were randomly collected.

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	Y/N/NA	Reconciliation Parameter
7c.	N/A homogeneous solids not being analyzed in this waste stream	Mean concentrations, upper 90% confidence limit (UCL ₉₀) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003-A6, and additional EPA Hazardous Waste codes were assigned as required. Samples were randomly collected.
8.	Y	The data demonstrates whether the waste stream exhibits are toxicity characteristic under 40 CFR 261, Subpart C.
9	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
10.	Y (at least 50 drums in this Summary Category Group have been examined)	Sufficient number of waste containers have been visually examined to determine the UCL ₉₀ for the miscertification rate is less than 14%.
11.	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12.	Y (1 TIC exceeded the 25%)	TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the QAPjP.
13.	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.

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	Y/N/NA	Reconciliation Parameter			
		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste stream or waste stream lot.			
			Completeness	Comparability	Representativeness
		Radiography	Y	Y	Y
		Headspace Gas Sampling And Analysis	N/A (online system in use at NTS)	N/A (online system in use at NTS)	N/A (online system in use at NTS)
		Headspace Gas Analysis	Y	Y	Y
14.		Solids Sampling	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream
		Total VOCs	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream
		Total SVOCs	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream
		Total Metals	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream	N/A homogeneous solids not being analyzed in this waste stream


Signature of Site Project ManagerCOURTNEY Fesmire
Printed Name30 June 03
Date